

Sequences

CDR Sequences

SEQ ID NO. 1	NYWLG
SEQ ID NO. 2	DIYPGGGYTNYNEKFKG
SEQ ID NO. 3	DIYPGGSYTNYNEKFKG
SEQ ID NO. 4	YDAAGPWFAY
SEQ ID NO. 5	YDAAGPGFAY
SEQ ID NO. 6	YDNHYFDY
SEQ ID NO. 7	RSSQSIVHSNGNTYLE
SEQ ID NO. 8	RSSQSLLHSNGNTYLH
SEQ ID NO. 9	KSSQSLLHSDGKTYLY
SEQ ID NO. 10	KVSNRFS
SEQ ID NO. 11	EVSSRFS
SEQ ID NO. 12	FQGSHVPYT
SEQ ID NO. 13	SQSTHVPYT

CDR Sequences (canonical structure variants)

SEQ ID NO. 14	NYWIG
SEQ ID NO. 15	NYWMG
SEQ ID NO. 16	NYWWG
SEQ ID NO. 17	NYWVG
SEQ ID NO. 18	DIYPGGDYTNYNEKFKG
SEQ ID NO. 19	DIYPGGNYTNYNEKFKG

SEQ ID NO. 20	DIYTGGGYTNYNEKFKG
SEQ ID NO. 21	DIYTGGDYTNYNEKFKG
SEQ ID NO. 22	DIYTGGNYTNYNEKFKG
SEQ ID NO. 23	DIYTGGSYTNYNEKFKG
SEQ ID NO. 24	DIYAGGGYTNYNEKFKG
SEQ ID NO. 25	DIYAGGDYTNYNEKFKG
SEQ ID NO. 26	DIYAGGNYTNYNEKFKG
SEQ ID NO. 27	DIYAGGSYTNYNEKFKG

SEQ ID NO. 28	RPSQSIVHSNGNTYLE
SEQ ID NO. 29	RSSQSLVHSNGNTYLE
SEQ ID NO. 30	RSSQSIVHSNGNTYFE
SEQ ID NO. 31	RPSQSLVHSNGNTYLE
SEQ ID NO. 32	RPSQSIVHSNGNTYFE
SEQ ID NO. 33	RSSQSLVHSNGNTYFE
SEQ ID NO. 34	RPSQSLLHSNGNTYLH
SEQ ID NO. 35	RSSQSILHSNGNTYLH
SEQ ID NO. 36	RSSQSLLHSNGNTYFH
SEQ ID NO. 37	RPSQSILHSNGNTYLH
SEQ ID NO. 38	RPSQSLLHSNGNTYFH
SEQ ID NO. 39	RSSQSILHSNGNTYFH
SEQ ID NO. 40	KPSQSLLHSDGKTYLY
SEQ ID NO. 41	KSSQSILHSDGKTYLY
SEQ ID NO. 42	KSSQSLLHSDGKTYFY
SEQ ID NO. 43	KPSQSILHSDGKTYLY
SEQ ID NO. 44	KPSQSLLHSDGKTYFY
SEQ ID NO. 45	KSSQSILHSDGKTYFY

Variable heavy chains VH

SEQ ID NO. 46

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSS

SEQ ID NO. 47

QVQLKQSGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGSYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCARYDNHYFDYWGQGTTLTVSS

SEQ ID NO. 48

QVQLKQSGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVSS

SEQ ID NO. 49

EVKLVESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTSVTVSS

SEQ ID NO. 50

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 51

EVKLVESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 52

QVQLKQSGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVSA

SEQ ID NO. 53

QVQLKQSGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 54

QVTLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTSTVTVSS

SEQ ID NO. 55

QVQLKQSGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTSTVTVSS

SEQ ID NO. 56

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVTVSS

SEQ ID NO. 57

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYYCAYYDAAGPWFAYWGQGTTLTVTVSS

SEQ ID NO. 58

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSRLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVTVSS

SEQ ID NO. 59

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMELSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVTVSS

SEQ ID NO. 60

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPBGQLERIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVTVSS

SEQ ID NO. 61

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTLLTVSS

SEQ ID NO. 62

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTLTVSS

SEQ ID NO. 63

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDSAVYFCAYYDAAGPWFAYWGQGTLLTVSS

SEQ ID NO. 64

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLTSEDSAVYYCAYYDAAGPWFAYWGQGTLLTVSS

SEQ ID NO. 65

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDTAVYFCAYYDAAGPWFAYWGQGTLLTVSS

SEQ ID NO. 66

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDTAVYYCAYYDAAGPWFAYWGQGTTLTVSS

SEQ ID NO. 67

QVQLVQSGAEVKKPGASVKVPCKASGYTFTNYWLGWVKQRPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDTAVYYCAYYDAAGPWFAYWGQGTLLTVSS

SEQ ID NO. 68

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDTAVYYCAYYDAAGPWFAYWGQGTLLTVSS

SEQ ID NO. 69

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDVAVYYCAYYDAAGPWFAYWGQGTTLTVSS

SEQ ID NO. 70

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDVAVYYCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 71

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLTSEDSAVYYCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 72

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLRSEDVAVYFCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 73

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYYCAYYDAAGPWFAYWGQGTTVTVSS

~~SEQ ID NO. 74~~ - - - - -

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSTSTAYMELSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSS

SEQ ID NO. 75

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPQGLEWIGDIYPGGGYTNYNE
KFKGRVTITADTSTSTAYMELSSLRSEDVAVYFCAYYDAAGPWFAYWGQGTTLTVSS

SEQ ID NO. 76

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWIGDIYPGGGYTNYNE
KFKGRVTITADTSTSTAYMELSSLRSEDVAVYYCAYYDAAGPWFAYWGQGTTLTVSS

SEQ ID NO. 77

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVKQRPGQGLEWIGDIYPGGGYTNYNE
KFKGRVTITADTSTSTAYMELSSLRSEDTAVYYCAYYDAAGPWFAYWGQGLTVTVSS

SEQ ID NO. 78

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWMGDIYPGGGYTNYNE
KFKGRVTITADTSTSTAYMELSSLRSEDTAVYYCAYYDAAGPWFAYWGQGLTVTVSS

SEQ ID NO. 79

QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYWLGWVRQAPGQGLEWMGDIYPGGGYTNYNE
KFKGRVTMTRDTSTSTVYMELSSLRSEDTAVYYCAYYDAAGPWFAYWGQGLTVTVSS

Variable light chains

SEQ ID NO. 80

DIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRA

SEQ ID NO. 81

DIVITQTPLSLPVSLGDQASISCRSSQSLLHSNGNTYLHWYLQKPGQSPKLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYFCSQSTHVPYTFGGGTKLEIKRA

SEQ ID NO. 82

DIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRA

SEQ ID NO. 83

DVLMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRA

SEQ ID NO. 84

DVLMTQTPLSLPVS LGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLELKRA

SEQ ID NO. 85

DIQMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 86

DIQMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 87

DIQMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPQLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 88

DIQMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPQLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 89

DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 90

DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 91

DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPQLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRA

SEQ ID NO. 92

DIVMTQSPLSLPVTTPGEPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPQLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQGTKVEIKRA

SEQ ID NO. 93

DIVMTQTPLSLPVTTPGQPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPQLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQGTKVEIKRA

SEQ ID NO. 94

DIVMTQTPLSLSVTPGQPASISCRSSQSIVHSNGNTYLEWYLQKPGQSPQLLIYKVSNRFG
VPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQGTKVEIKRA

V_H/V_L pairs

Mouse antibody

Karo1 SEQ ID NO. 46

SEQ ID NO. 80

Karo2 SEQ ID NO. 47

SEQ ID NO. 81

Karo3 SEQ ID NO. 48

SEQ ID NO. 80

Karo4 SEQ ID NO. 50

SEQ ID NO. 80

Karo5 SEQ ID NO. 53

SEQ ID NO. 82

Karo6 SEQ ID NO. 52
 SEQ ID NO. 83

Karo7 SEQ ID NO. 55
 SEQ ID NO. 83

Karo8 SEQ ID NO. 54
 SEQ ID NO. 80

Karo9 SEQ ID NO. 51
 SEQ ID NO. 83

Karo10 SEQ ID NO. 49
 SEQ ID NO. 80

humanized sequences

Karo11 SEQ ID NO. 56
 SEQ ID NO. 90

Karo12 SEQ ID NO. 57
 SEQ ID NO. 90

Karo13 SEQ ID NO. 57
 SEQ ID NO. 86

Karo14 SEQ ID NO. 58
 SEQ ID NO. 87

Karo15 SEQ ID NO. 56
 SEQ ID NO. 91

Karo16 SEQ ID NO. 59
 SEQ ID NO. 91

Karo17 SEQ ID NO. 60
 SEQ ID NO. 87

Karo18 SEQ ID NO. 61
 SEQ ID NO. 90

Karo19 SEQ ID NO. 56
 SEQ ID NO. 88

Karo20 SEQ ID NO. 56
 SEQ ID NO. 85

Karo21 SEQ ID NO. 59
 SEQ ID NO. 90

Karo22 SEQ ID NO. 62
 SEQ ID NO. 90

Karo23 SEQ ID NO. 59
 SEQ ID NO. 86

Karo24 SEQ ID NO. 74
 SEQ ID NO. 92

Karo25 SEQ ID NO. 63
 SEQ ID NO. 87

Karo26 SEQ ID NO. 74
 SEQ ID NO. 87

Karo27 SEQ ID NO. 74
 SEQ ID NO. 89

Karo28 SEQ ID NO. 74
 SEQ ID NO. 85

Karo29 SEQ ID NO. 64
 SEQ ID NO. 86

Karo30 SEQ ID NO. 74
 SEQ ID NO. 86

Karo31 SEQ ID NO. 63
 SEQ ID NO. 86

Karo32 SEQ ID NO. 65
 SEQ ID NO. 85

Karo33 SEQ ID NO. 65
 SEQ ID NO. 86

Karo34 SEQ ID NO. 66
 SEQ ID NO. 85

Karo35 SEQ ID NO. 67
 SEQ ID NO. 87

Karo36 SEQ ID NO. 68
 SEQ ID NO. 86

Karo37 SEQ ID NO. 72
 SEQ ID NO. 88

Karo38 SEQ ID NO. 69
 SEQ ID NO. 90

Karo39 SEQ ID NO. 70
 SEQ ID NO. 90

Karo40 SEQ ID NO. 69
 SEQ ID NO. 92

Karo41 SEQ ID NO. 73
 SEQ ID NO. 86

Karo42 SEQ ID NO. 69
 SEQ ID NO. 89

Karo43 SEQ ID NO. 71
 SEQ ID NO. 92

Karo44 SEQ ID NO. 56
 SEQ ID NO. 86

Karo45 SEQ ID NO. 65
 SEQ ID NO. 92

Various single-chain Fv formats

SEQ ID NO. 95

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSGG
GGSGGGGSGGSARDIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSP
KLLIYKVSNRFSQVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEI
KRAAAHHHHHHGAAEQKLISEEDLNAA

SEQ ID NO. 96

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSGS
GSSADIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS
NRFSGVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHH
HHGAAEQKLISEEDLNGAA

SEQ ID NO. 97

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSGG
SSADIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS
NRFSGVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHH
HHGAAEQKLISEEDLNGAA

SEQ ID NO. 98

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSGS
SADIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS
NRFSGVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHH
HHHGAEEQKLISEEDLNGAA

SEQ ID NO. 99

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSSS
ADIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS
NRFSGVPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHH
HHHGAEEQKLISEEDLNGAA

SEQ ID NO. 100

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSSA
DIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS
NRFSG

VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGA
AEQKLISEEDLNGAA

SEQ ID NO. 101

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASSAD
IQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFSGV
PDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGAA
EQKLISEEDLNGAA

SEQ ID NO. 102

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSASADI
QMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFSGVP
DRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGAAE
QKLISEEDLNGAA

SEQ ID NO. 103

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSAADIQ
MTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFSGVPD
RFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGAAEQ
KLISEEDLNGAA

SEQ ID NO. 104

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGTTVTVSSADIQM
TQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFSGVPDR
FSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGAAEQK
LISEEDLNGAA

SEQ ID NO. 105

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGT TVTVSSDIQMT
QTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSGVPDRF
SGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGAAEQKL
ISEEDLNGAA

SEQ ID NO. 106

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPGFAYWGQGT TVTVSDIQMTQ
TPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSGVPDRFS
GSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRAAAHHHHHHGAAEQKLI
SEEDLNGAA

Murine Antibodies

SEQ ID NO. 107

DIVITQTPLSLPVSLGDQASISCRSSQSLLHSNGNTYLHWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYFCSQSTHVPYTFGGGTKLEIKRADAAPTVSIFP
PSSEQLTSGGASVVCFLNNFYPKDINVKWKIDGSRQNGVLNSWTDQDSKDSTYSMSSTLT
TKDEYERHNSYTCEATHKTSTSPIVKSFNRNEC

SEQ ID NO. 108

DIQMTQTPLSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVS NRFSG
VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHVPYTFGGGTKLEIKRADAAPTVSIFP
PSSEQLTSGGASVVCFLNNFYPKDINVKWKIDGSRQNGVLNSWTDQDSKDSTYSMSSTLT
TKDEYERHNSYTCEATHKTSTSPIVKSFNRNEC

SEQ ID NO. 109

QVQLKQSGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPGHGLEWIGDIYPGGSYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCARYDNHYFDYWGQGTTLTVSESQSFPNV
FPLVSCESPLSDKNLVAMGCLARDFLPSTISFTWNYQNNTTEVIQGI RTFPTLRTGGKYLATS

QVLLSPKSILEGSDEYLVCKIHYGGKNRDLHVPIPAVAEMNPVNVFVPPRDGFSGPAPRKS
KLICEATNFTPKPITVSWLKDGLVESGFTTDPVTIENKGSTPQTYKVISTLTISEIDWNLN
NVYTCRVDHRGLTFLKNVSSTCAASPSTDILTFTIPPSFADIFLSKKSANLTCLVSNLATYET
LNISWASQSGEPLETKIKIMESHPNGTFSAGVASVCVEDWNNRKEFVCTVTHRDLPSPQKK
FISKPNVHKHPPAVYLLPPAREQLNLRESATVTCLVKGFSPADISVQWLQRGQLLPQEKYV
TSAPMPEPGAPGFYFTHSILTVTEEEWNSGETYTCVVGHEALPHLVTERTVDKSTGKPTLYN
VSLIMSDTGGTCY

SEQ ID NO. 110

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSESQSFP
NVFPLVSCESPLSDKNLVAMGCLARDFLPSTISFTWNYQNNTEVIQGIRTFPTLRTGGKYLA
TSQVLLSPKSILEGSDEYLVCKIHYGGKNRDLHVPIPAVAEMNPVNVFVPPRDGFSGPAPR
KSKLICEATNFTPKPITVSWLKDGLVESGFTTDPVTIENKGSTPQTYKVISTLTISEIDWL
NLNVYTCRVDHRGLTFLKNVSSTCAASPSTDILTFTIPPSFADIFLSKKSANLTCLVSNLATY
ETLNISWASQSGEPLETKIKIMESHPNGTFSAGVASVCVEDWNNRKEFVCTVTHRDLPSPQ
KKFISKPNVHKHPPAVYLLPPAREQLNLRESATVTCLVKGFSPADISVQWLQRGQLLPQEK
YVTSAPMPEPGAPGFYFTHSILTVTEEEWNSGETYTCVVGHEALPHLVTERTVDKSTGKPTL
YNVSLIMSDTGGTCY

mIgM-Karo2 SEQ ID NO. 109

SEQ ID NO. 107

mIgM-Karo4 SEQ ID NO. 110

SEQ ID NO. 108

Chimeric antibodies (mouse/human)

SEQ ID NO. 111

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPBGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSGSTKGP
SVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV

VTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKP
KDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVL
HQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKG
FYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSQVMHEALH
NHYTQKSLSLSPGK

SEQ ID NO. 112

QVQLKESGAELVRPGTSVKISCKASGYTFTNYWLGWVKQRPGHGLEWIGDIYPGGGYTNYNE
KFKGKATLTADTSSSTAYMQLSSLTSEDSAVYFCAYYDAAGPWFAYWGQGTTVTVSGSASAP
TLFPLVSCENSPSDTSSVAVGCLAQDFLPDSITLSWKYKNNSDISSTRGFPSVLRGKYAAT
SQVLLPSKDVMQGTDEHVCKVQHPNGNKEKNVPLPVIAELPPKVSFVPPRDGFFGNPRKS
KLICQATGFSPRQIQVSWLREGKQVGSGVTDDQVQAEAKESGPTTYKVTSTLTIKESDWLGQ
SMFTCRVDHRGLTFQQNASSMCVPDQDTAIRVFAIPPSFASIFLTKSTKLTCCLVTDLTYYDS
VTISWTRQNGEAVKTHNTNISESHPNATFSAVGEASICEDDWNSEGERFTCTVTHTDLPSPKQ
TISRPKGVALHRPDVYLLPPAREQLNLRESATITCLVTGFSPADVFVQWMQRGQPLSPEKYV
TSAPMPEPQAPGRYFAHSILTVSEEEWNTGETYTCVVAHEALPNRVTERTVDKSTGKPTLYN
VSLVMSDTAGTCY

SEQ ID NO. 113

DIQMTQTPSLPVSLGDQASISCRSSQSIVHSNGNTYLEWYLQKPGQSPKLLIYKVSNRFGS
VPDRFSGSGSGTDFTLKISRVEAEDLGVYYCFQGSHPVPTFGGGTKLEIKRTVAAPSVFIFP
PSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTYSLSSTLT
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Chimeric antibodies

cIgG-Karo4	SEQ ID NO. 111
	SEQ ID NO. 113

cIgM-Karo4	SEQ ID NO. 112
	SEQ ID NO. 113